Food Assistance Program Participation and Household Well-Being

Effects of Weight History, Resource Cycling, and Fast Food on Overall Diet Quality and Health in Low-Income Louisiana Women

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Grant awarded by the Southern Rural Development Center, Mississippi State University

Obesity is associated with health problems including heart disease, high blood pressure, and diabetes. Low-income women are more likely to be overweight or obese than those with higher incomes. The purpose of this project was to study the weight and diet of women receiving food stamps and to assess their understanding of diet, health, and food choices that contribute to obesity. Interviews were conducted with a convenience sample of 64 women receiving food stamps to determine food security status, diet history, and perception of diet and weight.

A modified version of the USDA food security short form was used to determine the women's food security status: food secure (FS), food insecure (FIS), and food insecure with hunger (FISH). Twenty-nine subjects were food secure (FS), 26 were food insecure (FIS), and 9 were food insecure with hunger (FISH).

After determining the women's food insecurity status, the study used the National Institutes of Health Criteria to calculate their Body Mass Index (BMI) by using their stated height and weight as measured by the researchers. The average BMI for each food security group was in the obese range. When asked to select a silhouette that matched their BMI, on average, all three groups chose a figure in the overweight group; and when asked to select their desired BMI, all groups selected a BMI in the normal weight range. FISH individuals were the least likely to identify themselves as obese (33 percent), while 44 percent of FS and 53 percent of FIS individuals were able to identify correctly their weight status.

Diet histories determined that the overall diet quality of the women was very poor: Both at the beginning of their resource cycle (Day 1), when they received their food stamps, and at the end of their resource cycle (Day 2). In all groups, energy intake dropped from the beginning of the month. Average intake of protein, carbohydrates, and total fat was within recommended ranges. However, for Day 1, the percentage of women exceeding recom-

mendations for total fat was 41, 38, and 44 for FS, FIS, and FISH, respectively. For Day 2, these percentages were lower, with the exception of the FS group which maintained the same level of fat intake. Average saturated fat, cholesterol, and sodium levels exceeded recommendations for all groups on both days of the resource cycle. All three groups reported a very low intake of fruits, vegetables, and dairy for both days.

Women self-rated their eating habits, the nutritional quality of their diet, and their knowledge of nutrition. Sixty-two percent of FS women rated the nutritional quality of their diet as poor/fair, while 65 percent of FIS women and 78 percent of FISH women rated their dietary quality as poor/fair. Fifty-nine percent of FS women ranked their eating habits in poor/fair range, whereas 54 percent of FIS women and 44 percent of FISH women did. Finally, 45 percent of FS women rated their nutrition knowledge as fair/poor, whereas 62 percent of FIS and 67 percent of FISH women did. When asked, the overwhelming majority of women were unable to define a healthy meal as outlined by the Food Guide Pyramid regardless of how they rated their own nutrition knowledge or eating habits.

About half (49 percent) of the total sample reported having received formal nutrition education through programs such as the Expanded Food and Nutrition Education Program or the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). In the FS group, 47 percent reported having had some nutrition education, and 52 percent of FIS group reported some exposure to nutrition education. Thirty-three percent of the FISH group reported receiving some type of nutrition education.

The study results underscore the lack of nutrition knowledge among low-income women. The research can aid policymakers, nutrition educators, and the women themselves understand more fully the relationship between food choices, past and present weight, and health status.

The Use of Twins To Understand the Effect of WIC on Birth Outcomes

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Grant awarded by the Institute for Research on Poverty, University of Wisconsin, Madison

There is little evidence in the clinical literature to suggest that supplemental nutrition for pregnant women in developed countries has an important effect on birth outcomes. By contrast, studies in the social science literature indicate that the Supplemental Nutrition Program for Women, Infants, and Children (WIC) has had a major impact on the incidence of preterm birth. Clinicians view this finding as suspect, since few interventions tested in randomized trials have proven effective at preventing preterm birth. This study takes a first step towards reconciling the belief among policy analysts of the efficacy of WIC with the skepticism among medical researchers that nutritional supplementation in the United States is a meaningful determinant of birth outcomes.

The original study objective was to analyze the effect of prenatal WIC participation on birth outcomes among twins. However, during the research, it became evident that the overall association between prenatal WIC participation and birth outcomes had weakened considerably in New York City between 1988 and 2001. Accordingly, the scope of the project was expanded to analyze why the association between WIC and infant health among all births had become less robust over time. The analysis of twins was an important auxiliary project to support this larger research question.

Associations in the social science studies between WIC and preterm birth may be due to omitted variable bias. Therefore, this research considered measures of fetal growth in addition to preterm birth as an outcome.

Second, cross-sectional birth certificate data were utilized to examine the extent to which the association between WIC and birth outcomes had changed over time, and if so, whether the changing composition of participants could explain the difference. The growth in WIC coincided with the expansion in Medicaid eligibility thresholds that occurred in the late 1980s and early 1990s. Women on Medical Assistance are automatically eligible for WIC, even if the income thresholds for Medicaid exceed those for WIC. As a result, the growth in WIC among pregnant women was likely to include proportionately fewer women at risk for adverse birth outcomes. With 14 years of data and over 800,000 births to women on Medicaid in New York City, the data provided a unique opportunity to test whether the changing composition of women on

Medicaid and WIC from the period before the Medicaid eligibility expansions through the most recent expansions for pregnant women under State Children's Health Insurance Program (SCHIP) could explain the weakening association with infant health.

Third, many studies reported that improvements in birth outcomes associated with WIC were greater among women at medical risk such as smokers, teenagers and those with a previous premature delivery. Such results were interpreted as evidence that WIC was more beneficial for women in need of nutritional assistance. But these risk factors tended to be correlated with other, harder to measure, determinants of birth outcomes such as substance abuse, sexually transmitted disease, and stressful home environments.

Effects associated with WIC among a sample of women who smoke, for instance, may reflect greater unobserved heterogeneity between WIC and non-WIC participants than was found among lower-risk groups such as nonsmokers. As a potentially less biased test of whether the association between WIC and birth outcomes was greater among women at nutritional risk, the analysis compared outcomes between WIC and non-WIC participants who deliver twins. Multiple gestations represent a random health shock that increases the risk of anemia, inadequate weight gain and adverse birth outcomes, but should be orthogonal to other risky behaviors.

Finally, a universal concern among WIC analysts has been selection bias. Do women who participate in WIC differ from non-participants in ways that are hard to measure but that are correlated with the outcomes of interest? As with almost all previous studies, this research lacked a truly exogenous instrument or quasi-experimental design to address selection bias directly. However, the analysis allowed the effects of WIC on fetal growth to vary over time and within relatively homogenous groups of women. Therefore, treatment effects that were clinically implausible and differed substantially over time and across groups should be interpreted cautiously and viewed as possible evidence of selection bias.

Findings indicate no statistical association between WIC and fetal growth, except for a positive association among US-born blacks who deliver twins. One implication may be that targeted nutritional supplementation during pregnancy might be useful. The broadly held notion that WIC improves birth outcomes emanates from its association with preterm birth, which the clinical literature has suggested is implausible. The analysis showed that prenatal WIC participation had at best a modest impact on fetal growth. Previous assessments of WIC by social scientists have tended to overlook the rather weak association with fetal growth.

Does WIC Reduce Prenatal Substance Use?

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This study examines the effect of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) on prenatal use of alcohol and tobacco of participating pregnant women. Previous research shows that small-scale interventions similar to those provided in a WIC clinic can have an effect on preventing or reducing prenatal smoking or drinking. Yet few studies have examined the impact of WIC education on prenatal substance use. This is an important issue since prenatal exposure to alcohol, drugs and tobacco is one of the leading preventable causes of birth defects, mental retardations, and neurodevelopmental disorders in the United States. Pregnant WIC participants exhibit these behaviors: 29 percent smoke during pregnancy, 16 percent drink alcohol, and 8 percent use marijuana. Such behaviors directly undermine WIC's goal of improving birth outcomes of poor children.

The study also examines the effect of state policies towards pregnant substance abusers on both WIC participation and prenatal substance use. These policies—which range from supportive (e.g., treatment and/or education) to punitive (e.g., child welfare investigations, termination of parental rights over prenatally exposed children, civil retention in a drug treatment facility for prenatal drug use)—may affect the participation of pregnant women in public health services. Yet little is known about their effects. The research reviews whether these policies change rates of prenatal drinking or smoking or have the unintended consequence of keeping women away from needed social services, including WIC.

Data from the National Longitudinal Survey of Youth, 1979 (NLSY) are used to study the effect of WIC on prenatal smoking and drinking. NLSY data are supplemented with information on state policies towards pregnant substance users. These data are rich enough to allow two-stage estimation models that control, where necessary, for sample selection into the pool of WIC participants. County characteristics help identify WIC effects in the two-stage models. The analysis incorporates the presence of multiple sibling families in the NLSY and estimate WIC effects using fixed-effect models.

Study results indicate that WIC's non-nutrition activities play a role in moderating prenatal drinking and smoking. The results were stronger for white mothers and for models of smoking reduction while pregnant. However, WIC participation did not result in complete abstinence from smoking or drinking for all pregnant WIC women. The results are consistent

with the literature showing that brief interventions can have a positive but limited effect on maternal behavior for the duration of the pregnancy.

The results suggest that, for nonwhite mothers, the State requirements for prenatal drug testing may discourage the use of health services like WIC. Instead, States with education and prioritized treatment may be more successful at exposing pregnant women to WIC services, including its array of nutrition-related activities Although punitive State approaches have received much media attention, these policies may not be a major factor in WIC participation, though this result could be driven by the limited number of affected pregnancies in the data.

The study suggests that pregnancy is a "teachable moment" when pregnant women are responsive even to small interventions that appeal to their desire to have healthy children. WIC provides a unique opportunity to engage low-income women who are at higher risk for prenatal substance use and unfavorable birth outcomes. WIC appears to affect the behavior of pregnant women even though its nutrition education sessions are not required for the receipt of other benefits.

Are Economic Incentives Useful for Improving Dietary Quality Among WIC Participants and Their Families?

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Dietary quality, as measured by fruit and vegetable intake, is a powerful protective factor against a number of common chronic diseases, including several causing premature death and disability. Low income is well-established as a risk factor for poor dietary quality in the United States. The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) program provides a context for investigating means to improve fruit and vegetable consumption in a vulnerable population.

WIC was designed and developed before the relationship of fruit and vegetable intake to chronic disease risk was well-established, and the foods were selected to supplement the nutrients that were thought to be most limited in the diets of low-income women and children, namely protein, calcium, vitamin A, and vitamin C. Recently, there has been discussion about adding fruits and vegetables to the WIC food package, potentially on a cost-neutral basis. A recent report by the Institute of Medicine reviewed the current public health context for the development of WIC food packages and proposed criteria for the inclusion of food items. Fruits and vegetables were among the highest priority food groups. This research investigated whether providing supplemental financial support targeted for purchase of fresh fruits and vegetables would result in high uptake of the supplement and whether the individuals would continue to consume more fruits and vegetables after financial support was discontinued.

A nonequivalent control group design was used to provide vouchers for fresh fruits and vegetables to low-income women participating in the Public Health Foundation Enterprises WIC program in Los Angeles, CA. The study recruited 602 women who were enrolling for postpartum services at three selected WIC program sites (approximately 200 per site). Sites were assigned to: intervention with vouchers redeemable at a local supermarket; intervention with vouchers redeemable at a nearby year-round farmers' market; and a control site with a minimal nonfood incentive for participation in interviews. Vouchers were issued bimonthly, at the level of $10 per week. Interventions were carried out for 6 months, and participants' diets were followed for an additional 6 months after the intervention. Quantitative 24-hour dietary recalls were conducted at four interviews for each participant.

At the intervention sites, two extra interviews spaced 2 months apart were held to obtain information on the fruits and vegetables purchased with the vouchers. Specifically, participants were asked to respond to the question "What did you buy with your fruit and vegetable coupons last week?" Voucher redemption rates were obtained from scanned data from the supermarket's corporate headquarters. In the farmers' markets, vouchers presented for purchase were collected by the farmers' market manager and turned into the city government's accounting department for tallying. Vouchers were then mailed to the study's research staff, who re-counted the redeemed vouchers and logged the tallies into an electronic database.

In all, $44,000 worth of vouchers were issued for the supermarket and $44,960 for the farmers' market. Redemption rates were 90.7 percent for the farmers' market and 87.5 percent for the supermarket. Overall, participants reported purchasing 27 and 26 different fruits, and 34 and 33 different vegetables in the farmers' market and supermarket outlets, respectively. Five fruits and five vegetables accounted for about 70 percent of the items reported for each group. The 10 most frequently reported items were oranges, apples, bananas, peaches, grapes, tomatoes, carrots, lettuce, broccoli and potatoes. A larger number of item purchases were reported for the farmers' market although the total number of types of fruits and vegetables did not differ significantly between the two market settings.

Participation in the interventions increased consumption of fruits and vegetables with use of the supplement and that increase was sustained 6 months after the intervention. At baseline, participants at the farmers' market reported eating 2.2 servings/1,000 kilocalories (kcal) on average, 2.9 servings/1,000 kcal at the supermarket site, and 2.6 servings/1,000 kcal at the control site. Six months postintervention, this same comparison was made, and the increase in participant fruit and vegetable intake reported by intervention site was sustained. Participants at both the farmers' market and supermarket sites reported eating 4.0 servings of fruits and vegetables/1,000 kcal on average, while control site participants reported eating 3.1 servings/1,000 kcal on average. The difference in consumption between each of the intervention sites and the control site was statistically significant even after adjusting for multiple factors. The results were unaffected when evaluating consumption of fruits and vegetables excluding beans and potatoes, and fruits and vegetables excluding juices. Increases in vegetable consumption were primarily responsible for the overall increases in fruit and vegetable intake.

A linear regression analysis using baseline demographics, government program participation, body composition, food security status, reported energy intake, reported fruit and vegetable intake, infant feeding method, and treatment site explored which of these factors were associated with fruit and vegetable intake six months post-intervention. The results indicated that higher reported intake of fruits and vegetables 6 months postintervention was associated with reported fruit and vegetable intake at baseline, preference for speaking Spanish, and participating at either the farmers' market site or the supermarket site compared to the control site.

In summary, the variety of choices of fruits and vegetables exhibited in this study leads to the conclusion that, in this setting, low-income consumers make

varied and nutritious choices from available produce. The findings point to the potential for dietary improvement with a targeted subsidy that allows free choice within the fresh produce category. Neither the supermarket nor the farmers' market found the study particularly burdensome, and both outlets were positive about their participation. No specific barriers arose to voucher redemption by participants or retailers. In addition to the economic intervention, the high intake of fruits and vegetables may be attributed to the large proportion of Latinos included in the study population. The study participants' sustained intake of fruits and vegetables may reflect retained cultural food behavior habits and the study's timing at a critical point in a family—the birth of a child and the surrounding concern for a healthy child.